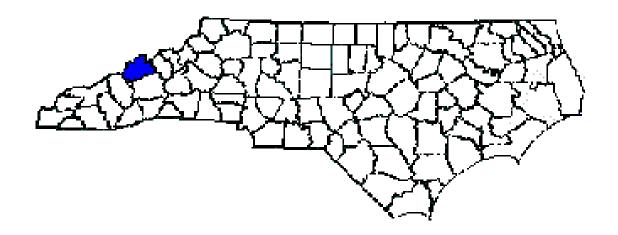
ANNUAL REPORT FOR 2015



Middle Fork Creek Site A Mitigation Site Madison County TIP No. R-2518A

COE Action ID: SAW-2007-2197-357/300

DWR #: 20071134



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APPENDICES

Appendix A – Site Photographs

SUMMARY

The following report summarizes the stream monitoring activities that have occurred during the Year 2015 at the Middle Fork Creek Site A Mitigation Site in Madison County. The North Carolina Department of Transportation (NCDOT) completed this project in January 2009 (Sta. 10+50 to 11+50) and May 2011 (Sta. 13+20 to 14+20). This report provides the monitoring results for the sixth formal year of monitoring (Year 2015). The Year 2015 monitoring period was the sixth of five scheduled years of monitoring on the Middle Fork Creek Site A Mitigation Site (See Success Criteria Section 2.1).

Based on the overall conclusions of monitoring at the Middle Fork Creek Site A, it has met the required monitoring protocols for the sixth formal year of monitoring on the stream and the fourth formal year of monitoring on the planted vegetation. It was agreed by the Regulatory Agencies and NCDOT during the March 18, 2015 Annual Monitoring Meeting that the stream surveying could be discontinued. In lieu of doing the stream surveying, visual inspection of the channel stability throughout the reach and photo documentation at the permanent photo point locations would be completed. All other monitoring activities will continue to be completed throughout the monitoring period. The channel throughout the stream site is stable at this time.

The streambank and buffer area were planted in March 2012 with live stakes and bareroot seedlings. The planted vegetation is surviving at this time.

NCDOT proposes to continue visual stream and vegetation monitoring at the Middle Fork Creek Site A Mitigation Site in 2016.

1.0 INTRODUCTION

1.1 Project Description

The following report summarizes the stream monitoring activities that have occurred during the Year 2015 at the Middle Fork Creek Site A Mitigation Site. Site A is located on US 19 in Madison County at Sta. 19+80 -L- Rt. and Lt. and Sta. 21+40 -L- Lt. (Figure 1). The Middle Fork Creek Site A was constructed to provide mitigation for stream impacts associated with Transportation Improvement Program (TIP) number R-2518A in Madison County.

The mitigation site provided approximately 239 linear feet of stream restoration, 476 linear feet of stream enhancement, and 479 linear feet of stream preservation. Construction was completed during January 2009 (Sta. 10+50 to 11+50) and May 2011 (Sta. 13+20 to 14+20) by the NCDOT. Stream restoration involved installing several in-stream cross vane structures and planting the riparian buffer zone.

1.2 Purpose

In order for a mitigation site to be considered successful, the site must meet the success criteria. This report details the monitoring in 2015 at the Middle Fork Creek Site A Mitigation Site. Hydrologic monitoring was not required for this site.

1.3 Project History

| January 2009 October 2009 | Construction Completed (Sta. 10+50 to 11+50) As-Built Survey Completed (Sta. 10+50 to 11+50) |
|------------------------------|--|
| March 2009 | Site Planted (Type I only) |
| November 2010 | Stream Channel Monitoring (Year 1) |
| May 2011 | Construction Completed (Sta. 13+20 to 14+20) |
| November 2011 | As-Built Survey Completed (Sta. 13+20 to 14+20) |
| November 2011 | Stream Channel Monitoring (Year 2) |
| March 2012 | Site Planted (Type I and II) |
| September 2012 | Vegetation Monitoring (Year 1) |
| November 2012 | Stream Channel Monitoring (Year 3) |
| February 2013 | Live Staked Preservation Area Between PP#3 & PP#4 |
| March 2013 | Bankfull Monitoring Gauge Installed |
| August 2013 | Vegetation Monitoring (Year 2) |
| November 2013 | Stream Channel Monitoring (Year 4) |
| July 2014 | Sprayed Small Patch of Japanese Knotweed |
| July 2014 | Vegetation Monitoring (Year 3) |
| November 2014 | Stream Channel Monitoring (Year 5) |
| July 2015 | Vegetation Monitoring (Year 4) |
| November 2015 | Visual Stream Channel Monitoring (Year 6) |

1.4 Debit Ledger

The entire Middle Fork Creek Site A stream mitigation site was used for the R-2518A project to compensate for unavoidable stream impacts.

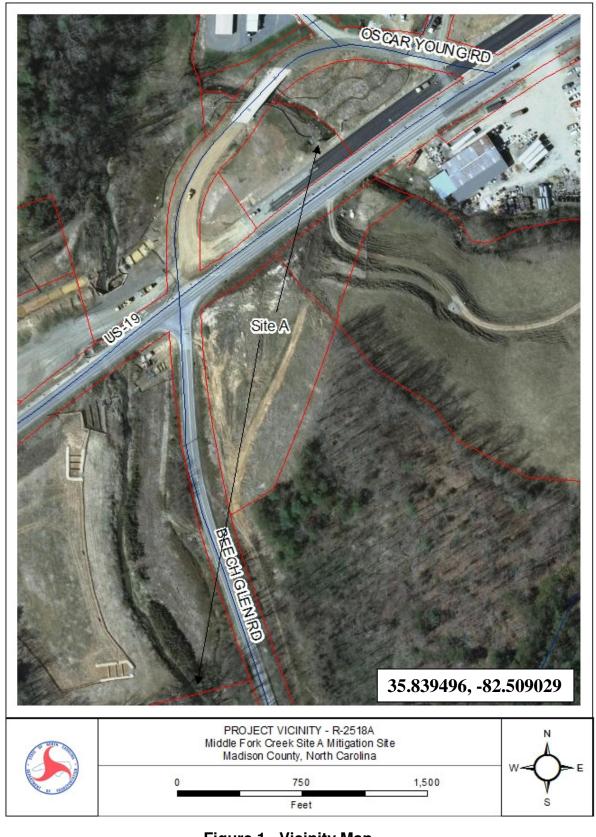


Figure 1. Vicinity Map

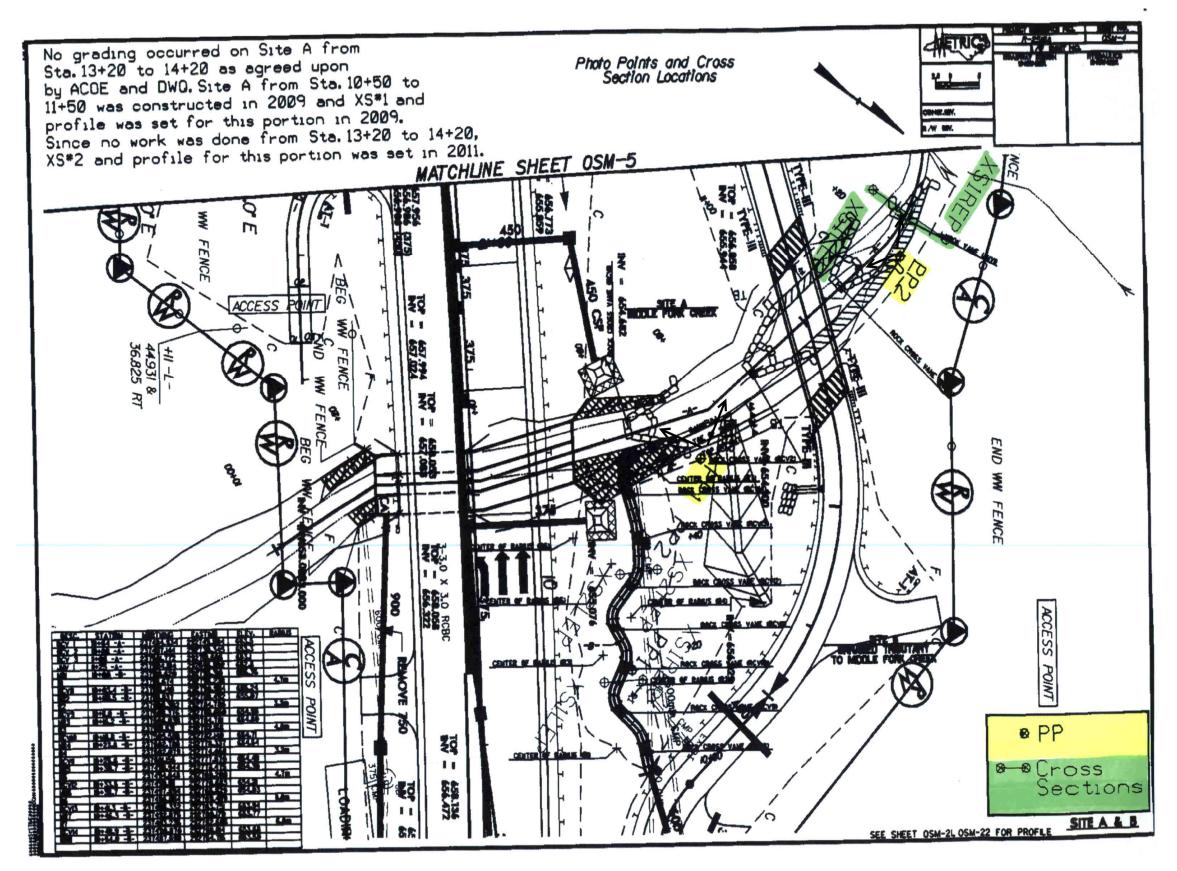


Figure 2. Site A Map

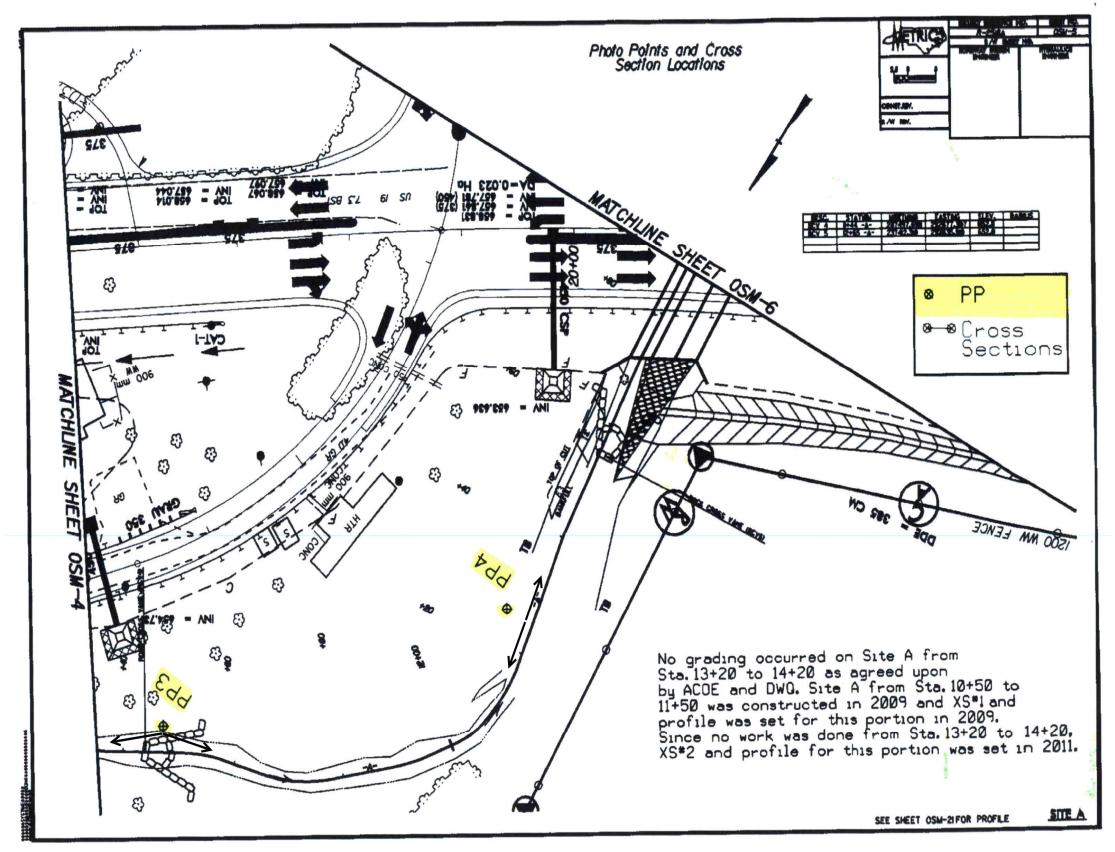


Figure 3. Site A Map

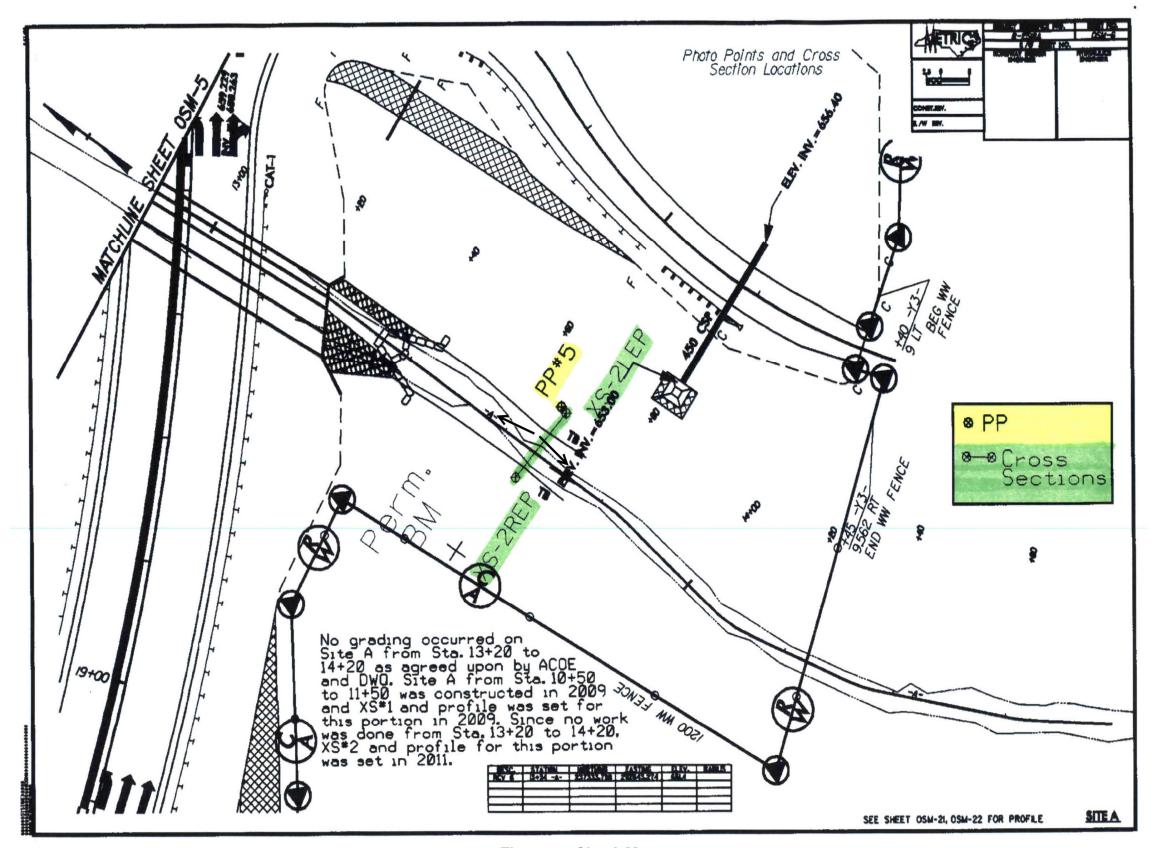


Figure 4. Site A Map

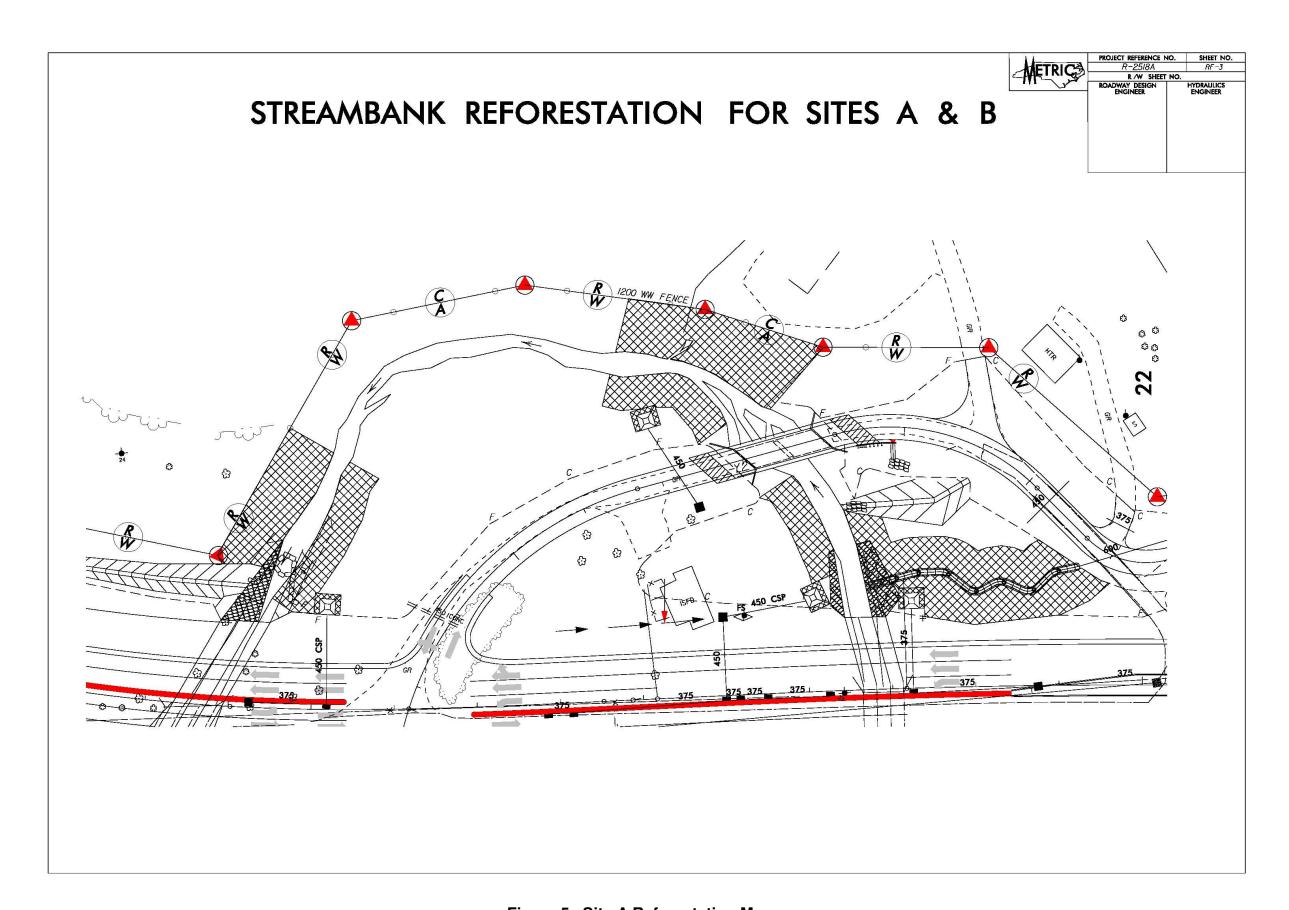


Figure 5. Site A Reforestation Map

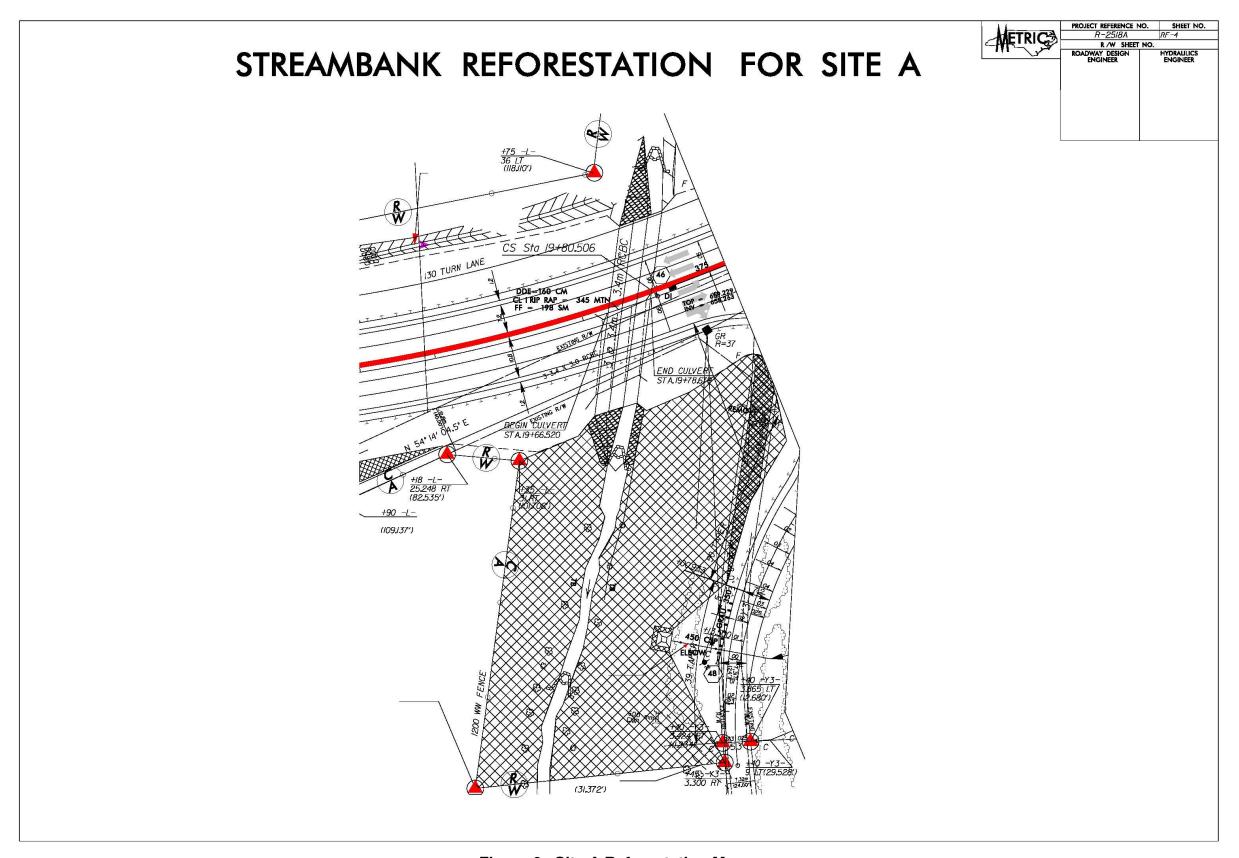


Figure 6. Site A Reforestation Map

2.0 STREAM ASSESSMENT

2.1 Success Criteria

The permittee shall monitor the restoration and enhancement mitigation sites following the Level 1 protocols outlined in the "Stream Mitigation Guidelines," dated April 2003 with the following exceptions:

- 1. Pebble counts shall not be conducted.
- 2. Two cross sections shall be conducted for streams less than 500 linear feet and five (5) cross sections shall be conducted for streams greater than 500 linear feet.
- 3. Riparian success shall be by visual inspection of plant survival. Photos will be taken and comments noted on plant survival.

The permittee shall monitor the preservation sites by visual inspection. Photos will be taken and comments noted on plant survival. The monitoring shall be conducted annually for a minimum of five (5) years after final planting. The monitoring results shall be submitted to DWR in a final report within sixty (60) days after completing monitoring. After 5 years the NCDOT shall contact the DWR to schedule a site visit to "close out" the mitigation site.

2.2 Stream Description

2.2.1 Post-Construction Conditions

The restoration of the Middle Fork Creek Site A Mitigation Site involved installing several in-stream cross vane structures and planting the riparian buffer zone.

2.2.2 Monitoring Conditions

The objective of the Middle Fork Creek Site A stream restoration was to restore a B4c stream as identified in Rosgen's Applied River Morphology. A total of two cross sections (one in a riffle and one in a pool) were surveyed. For this report, only cross sections containing riffles were used in the comparison of channel morphology. Morphology table comparison can be found in the 2010 to 2014 monitoring reports.

2.3 Results of the Stream Assessment

2.3.1 Site Data

The assessment included the survey of two cross sections and the longitudinal profile of the Middle Fork Creek Site A established by NCDOT after construction. The length of the profile along the Middle Fork Creek Site A was approximately 652 linear feet. Two cross sections were established during the as-built monitoring years. Cross section locations were subsequently based on the stationing of the longitudinal profile and are presented below. The location of the cross sections and longitudinal profile are shown in the 2010 to 2014 monitoring reports Appendix A.

Middle Fork Creek Site A Cross-Sections:

- Cross-Section #1: Middle Fork Creek Site A, Station 240+50, midpoint of pool
- ◆ Cross-Section #2: Middle Fork Creek Site A, Station 1158+00, midpoint of riffle

Based on comparisons of the As-Built to the monitoring data, all of the cross sections appear stable with little or no active bank erosion. Graphs of the cross sections are presented in the 2010 to 2014 monitoring reports Appendix A.

It was agreed by the Regulatory Agencies and NCDOT during the March 18, 2015 Annual Monitoring Meeting that the stream surveying could be discontinued. In lieu of doing the longitudinal profile, visual inspection of the channel stability throughout the reach and photo documentation at the permanent photo point locations would be completed. All other monitoring activities will continue to be completed throughout the monitoring period. Based on the visual inspection, the channel is stable at this time. Pebble counts were not required per the permit conditions and therefore were not completed. Four bankfull events were documented with a surface water gauge at Site A during the 2013 and 2014 monitoring year.

3.0 VEGETATION: MIDDLE FORK CREEK SITE A

3.1 Description of Species

The following tree species were planted on the streambank:

Salix nigra, Black Willow

Cornus amomum, Silky Dogwood

The following tree species were planted in the buffer area:

Liriodendron tulipifera, Yellow Poplar

Platanus occidentalis, Sycamore

Fraxinus pennsylvanica, Green Ash

Quercus alba, White Oak

3.2 Results of Vegetation Monitoring

Streambank & Buffer Vegetation: The streambank reforestation was completed in March 2012. The Year 4 vegetation monitoring evaluation noted: Type I: Black Willow, Silky Dogwood and Type II: Sycamore, Green Ash, Tulip Poplar and White Oak were surviving at the time of the monitoring evaluation. There was no Japanese Knotweed noted onsite at the time of monitoring.

3.3 Conclusions

NCDOT will continue to monitor the planted vegetation in 2016.

4.0 OVERALL CONCLUSIONS/RECOMMENDATIONS

The Middle Fork Creek Site A Mitigation Site has met the required monitoring protocols for the sixth formal year of monitoring on the stream and the fourth formal year of monitoring on the planted vegetation. The channel throughout the stream site is stable and the planted vegetation is surviving at this time.

NCDOT proposes to continue visual stream and vegetation monitoring at the Middle Fork Creek Site A Mitigation Site in 2016.

5.0 REFERENCES

- Stream Mitigation Plan, US Highway 19, R-2518A On-Site Mitigation Madison County, North Carolina, August 2006.
- Design Plans for R-2518A, US 19 from I-26 to 0.8 KM east of the Yancey Co. Line, Stream Mitigation (Preservation, Enhancement, and Restoration), HSMM.
- North Carolina Department of Transportation (NCDOT), April 29, 2008. 404 and 401 Individual Permits for R-2518A and R-2518B (ACOE Permit No. 2007-2197-357/300 and DWR Project No. 20071134, Individual Certification No. 3706).
- Rosgen, D.L, 1996. Applied River Morphology. Wildland Hydrology, Pagosa Springs, Colorado.
- US Army Corps of Engineers (USACE), 2003. Stream Mitigation Guidelines. Prepared with cooperation from the US Environmental Protection Agency, NC Wildlife Resources Commission, and the NC Division of Water Resources.

APPENDIX A SITE PHOTOGRAPHS

Middle Fork Creek Site A



Photo Point #1 (Upstream)



Photo Point #1 (Downstream)



Photo Point #2 (Upstream)



Photo Point #2 (Downstream)



Photo Point #3 (Upstream)



Photo Point #3 (Downstream)

November 2015

Middle Fork Creek Site A



Photo Point #4 (Upstream)



Photo Point #4 (Downstream)



Photo Point #5 (Upstream)



Photo Point #5 (Downstream)

November 2015

Middle Fork Creek Site A



Vegetation Overview Photo



Vegetation Overview Photo



Vegetation Overview Photo



Vegetation Overview Photo

July 2015